

**Remarks/Arguments**

Claims 25 and 39 have been amended.

The Examiner has rejected applicants' claims 25, 27-28, 31-36, 39, 41-42 and 45-50 under 35 USC 103(a) as being unpatentable over the Black patent (U.S. Pat. No. 6,307,956) in view of the Yquerabide, et al. patent (U.S. Pat. No. 6,586,193) and further in view of either the Schmidt, et al. patent (U.S. Pat. No. 7,094,531) or the Lockhart, et al. patent (U.S. Pat. No. 6,344,316). Applicants have amended applicants' independent claims 25 and 39 and with respect to these claims, as amended, and their respective dependent claims, the Examiner's rejections are respectfully traversed.

Applicants' independent claim 25 has been amended to recite an authentication system for personal authentication which is used together with an authentication certificate on which a DNA array reacted with a gene obtained from a given person is attached, the DNA array carrying a plurality of spots of DNA probes corresponding to plural kinds of genes in a predetermined order, the system comprising: storage means for storing registration information which includes layout information representing a hybridized pattern of reacted DNA array, acquisition means for reading the hybridization pattern of a reacted DNA array attached on an authentication certificate and acquiring layout information from the hybridization pattern, and controlling means for executing a process comprising the steps of: (i) generating authentication information on the basis of the layout information acquired by the acquisition means, and (ii) collating the authentication information with the registration information as a reference stored in the storage means, and making authentication, wherein a plurality of spots of different DNA probes are arranged on the DNA array so that the DNA array presents a different hybridization pattern depending on a different personal DNA, each

of the spots indicates presence or absence of a target gene arrangement by presence or absence of reaction and the hybridization pattern is a two-dimensional binary pattern indicated by the presence or absence of the reaction at the spots. Applicants' independent claim 39 has been similarly amended.

As can be appreciated from the above, the invention recited in applicants' amended independent claims 25 and 39 and , in particular, the features of the invention as recited in the wherein clause in each claim, require that each of the spots on the DNA array indicate presence or absence of a target gene arrangement by presence or absence of reaction, and a two-dimensional binary pattern is obtained from the reacted DNA array by the presence or absence of the reaction spots. By virtue of these features, authentication using the DNA array can be quickly performed with a reduced amount of authentication data. For example, the two-dimensional binary pattern (hybridization pattern) can be directly used for authentication.

The Black patent teaches an identity verification system that employs biometric properties for identity verification, and teaches that DNA can be employed as such biometric properties. More particularly, the Black patent teaches that arrays of immobilized single-stranded DNA (ssDNA) probes, so-called DNA chips, can be utilized. However, the Black patent fails to teach or suggest the pattern information obtained from the DNA chips.

The Yguerabide, et al. patent teaches obtaining pattern information by using a "DLASLPD" (direct light angled for scattered light only from particle detected) method. Conventionally, as indicated in the Yguerabide, et al. patent, pattern data indicating a pattern of reaction strengths are used for comparing DNA chip patterns.

To the contrary, applicants' invention of independent claims 25 and 39 uses pattern data indicating a two-dimensional binary pattern, and, therefore, applicants' claimed

invention reduces the data amount to be compared and achieves quick authentication. The claimed invention thus does not need the complex analysis step for pattern data as disclosed in the Yguerabide, et al. patent.

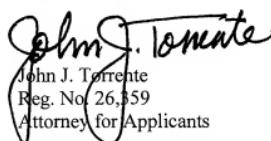
Applicants' amended independent claims 25 and 39, and their respective dependent claims, in reciting "wherein a plurality of spots of different DNA probes are arranged on the DNA array so that the DNA array presents a different hybridization pattern depending on a different personal DNA, each of the spots indicates presence or absence of a target gene arrangement by presence or absence of reaction and the hybridization pattern is a two-dimensional binary pattern indicated by the presence or absence of the reaction at the spots, in combination with the other features of the claims, thus patentably distinguish over the Black and Yguerabide, et al. patents. Also, the Schmidt, et al. and Lockhart, et al. patents fail to add anything to the Black and Yguerabide, et al. patents to change this conclusion. Applicants' amended claims thus patentably distinguish over all these references.

In view of the above, it is submitted that applicants' claims, as amended, patentably distinguish over the cited art of record. Accordingly, reconsideration of the claims is respectfully requested.

Dated: January 6, 2009

Respectfully submitted,

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